RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 52-06-05

Log Event A

Borehole Information

Farm : TY	**Tank :** TY-106	**Site Number :** 299-W15-79
N-Coord : 42,358	**W-Coord :** 75,912	**TOC Elevation :** 672.80
Water Level, ft :	**Date Drilled :** 8/31/1952	

Casing Record

Type : Steel-welded	Thickness : 0.313	ID, in. : 8
Top Depth, ft. : 0	Bottom Depth, ft. : 148	

Borehole Notes:
According to the driller's records, this borehole was perforated from 40 to 100 ft but was not grouted.

The casing thickness is presumed to be 0.322 in., on the basis of published thickness for schedule-40, 8-in. steel tubing.

Equipment Information

Logging System : 1	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 04/1996	**Calibration Reference :** GJPO-HAN-5	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number : 1	**Log Run Date :** 5/2/1996	**Logging Engineer:** Mike Widdop
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 18.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 5/3/1996	**Logging Engineer:** Mike Widdop
Start Depth, ft.: 148.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 17.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Borehole 52-06-05

Log Event A

Analysis Information

Analyst : S.D. Barry

Data Processing Reference : P-GJPO-1787 Analysis Date : 1/31/1997

Analysis Notes :

This borehole was logged in two log runs. The pre-survey field verification spectra from both log runs did not pass the acceptance criteria established for the peak shape and system efficiency. A nonconformance report issued in August 1996 (N-96-05) identified this failure as a power supply malfunction that resulted in a low detector bias voltage supplied to the logging tool. This malfunction occurred in the mornings immediately following system start-up, but ceased after an extra long warm-up period (about 1 to 2 hours). The nonconformance report also documents that concentrations calculated from data collected in the first 2 hours of logging could be systematically understated by about 10 percent. Therefore, the data from log runs one and two may show a repeatability problem upon relogging of the borehole in the future.

The post-survey field verification spectra for both log runs passed the acceptance criteria for the peak shape and system efficiency, providing evidence that the logging system was operating appropriately after an initial warm-up time. The energy calibration and peak-shape calibration from verification spectra that successfully met the established acceptance criteria were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation. Corrections for gain drifts during data collection were not necessary during processing of the data to maintain proper peak identification.

A correction factor for a 0.322-in.-thick casing was not available; therefore, a casing correction factor for 0.330-in.-thick steel casing was applied during analysis. Use of the correction factor for the thicker casing may result in calculated radionuclide concentrations that are slightly higher than the actual concentrations.

The man-made radionuclides Cs-137 and Co-60 were detected in this borehole. The presence of Cs-137 was measured continuously from the ground surface to about 1 ft, intermittently from 1 to 52 ft, almost continuously from 52 to 55 ft, intermittently from 55 to 110 ft, from 110.5 to 112.5 ft, and intermittently from 112.5 to 133.5 ft. The maximum Cs-137 concentration was 1.2 pCi/g at 111.5 ft. Measurable Co-60 concentrations were detected at 2.5 ft, continuously from 52 to 76.5 ft, intermittently from 76.5 to 90 ft, continuously from 92.5 to 98.5 ft, and continuously from 130 to 148 ft. The maximum Co-60 concentration was 3.2 pCi/g at 144.5 ft.

The K-40 concentrations begin to increase at about 47 ft. The Th-232 and U-238 concentrations begin to increase at about 90 ft. A region of lesser K-40 and Th-232 values was detected between 103 and 118 ft. A region of increased U-238 values was detected between 113.5 and 118 ft. Beginning at about 120 ft, the K-40 concentration values begin to decrease, and at about 127 ft the Th-232 concentration values begin to decrease.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks TY-105 and TY-106.

Log Plot Notes:

Separate log plots show the man-made (Cs-137 and Co-60) and the naturally occurring radionuclides (KUT). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Borehole 52-06-05

Log Event A

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A time-sequence plot was generated from the historical gross gamma logs acquired between 1975 and 1987 and is presented with the SGLS logs.